

The Connection of Furniture Through Modular Forms

Craig Rex Harris BFA (Hons) (Furniture Design)

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Signed Statement of Originality

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ABSTRACT

The aim of the research project was to create a body of work that will be considered adaptable, dynamic and contemporary by those who interact with it. The furniture is based on the concepts of flexibility and multiple configuration, rather than on rigidity and 'single-purpose' engagements. This allows the user to have the freedom to interact with the furniture by moving and changing it to create numerous different arrangements and formations. The furniture is designed specifically for placement in a variety of different environments including foyers, galleries, public spaces and private residences. Central to this range of furniture is the notion of 'contemporary living'.

Given the research is based on multiple configuration, the exploration of production techniques, including fabrication systems and methodology, was necessary to ensure the required number of pieces could be produced, and to further ensure consistency throughout.

The body of work has clearly been influenced by two aspects of contemporary culture. The first involves the surf and skate culture of the past twenty years. A range of facets within this culture have been motivational including the progression of design in the surf and skate industry, retail stores featuring bright, multiple and repetitive merchandise and even the simple, leisurely acts of surfing and skating themselves. The second area of influence encompasses contemporary designers, particularly those working with uninterrupted, flowing, humanised forms and further, production and fabrication technology. Key designers including Ron Arad, Tom Dixon and Marc Newson are at the forefront of this category of design and their work has inspired

experimentation with various production processes throughout the development of this body of work.

The furniture designed and developed for this research project encompasses the concepts of multiple configuration and adaptability, and is a reflection of contemporary Australian culture. Furthermore, by allowing the pieces to be continually changed and moved to represent different configurations, the body of work promotes individualism and creative expression within those who interact with it. It also challenges the conventional, and somewhat restrictive, 'single-purpose' notion which is often associated with the use of furniture in both public and private environments.

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1.0 INTRODUCTION

1.1 STATEMENT OF PURPOSE

The aim of this research project was to create a body of work that will be considered adaptable and contemporary by those who interact with it. The furniture is based on the concepts of multiple configuration and flexibility and as such, the notion of modularity was explored in order to achieve an adaptable body of work. This flexibility invites consumers to interact with and handle the furniture by moving and changing it to create different arrangements and formations.

Essentially, the furniture designed and developed for this research project is dynamic, and a reflection of contemporary Australian culture. The adaptability feature that allows the pieces to be continually reconfigured promotes individualism and creative expression within those who interact with it. It also challenges the conventional, and somewhat restrictive, 'single-purpose' notion, which is often associated with furniture in both public and private environments.

1.2 THE PARAMETERS OF THE RESEARCH PROJECT

The research undertaken in order to create the range of furniture revolves around four distinct concepts. These concepts constitute the parameters for the project and include: modularity (the utilisation of modular forms); production techniques (the utilisation of rotational moulding and other techniques in the production of the furniture); the creation of minimal objects (achieved by utilising curvaceous forms, the circle and radial arcs); and finally, the creation of a co-ordinated and related range of contemporary furniture.

1.2.1 Modularity

By utilising the concept of modularity, a series of shapes based on the circle were designed with an interlocking feature that enables them to connect with each other. While an interesting concept, the use of modularity has limitations as not every shape can be connected with itself or even placed next to each other in an aesthetically pleasing manner. The two shapes I have chosen to use include the circle and segmental portions of the circle. These portions are elliptical in shape.

1.2.2 Production Techniques

Numerous possible production and fabrications techniques exist; however, the body of work I developed used factory production techniques to produce the multiple forms I required. Utilisations of this particular technique, required experimentation with a range of materials, including polyethylene, stainless steel, earthen ware slip, aluminium, acrylic and sprayed Medium Density Fibreboard (MDF). Experimentations with these materials produced successful results and as such, they were selected and manipulated using factory production techniques to produce the body of work I designed.

1.2.3 Minimal Objects

The range of furniture essentially hinges on this particular parameter. It was my intention to create a body of work that used the same type of shape throughout. That said, however, the shape had to be minimal and I have achieved this by using the curvaceous lines of the circle and radial arcs in each piece in the range. All my designs are conceived from a two-dimensional plan drawing. For example, the basic shape used in the *6S Seats and Tables* (2000) (termed the *6S Shape*) begins as a circle with three elliptical sections removed from it at regular intervals. This results in a six-sided hexagon shape with alternate sides created

from equal radius concave and convex lines. A similar process was discovered when designing the *SOS Boxes* (1999). This two-dimensional, hexagon-type shape is represented three-dimensionally in a large proportion of the pieces, which makes up the range of furniture. The elliptical shapes cut from the initial circle influenced other pieces including the *Cluster Vases* (2001) and *Cluster Light* (2000). The third shape used in the range of furniture appears in the *MLS Lights* (2001). While still based on the circle, only one arc is removed. The measurement of the arc removed from the circle is the same as that of the overall radius and this ensures each individual form can connect with itself to form multiple lines or curves in the same way as the other two shapes discussed above can. Hence my design requirement, which stipulates that each shape must be able to connect or interlock with itself, could be realised.

1.2.4 Co-ordinated Range of Contemporary Furniture

The final, but most important parameter was to create a range of furniture where each individual piece co-ordinated and related to the other in any given environment. The use of similar forms, materials and productions techniques have ensured this objective could be realised. Every individual piece uses the circle as its base (*6S Seats and Tables* (2000) and the *MLS Light* (2001)), or the elliptical pieces removed from a circular shape (*Cluster Vases* (2001) and *Cluster Light* (2000)). The use of similar colours in each piece further ensures connection and co-ordination throughout the range.

1.3 STRUCTURE OF THIS SUPPORTING EXERGESIS

This Exegesis provides support and explanation to the body of work created. Initially, it considers the influences and motivation behind the research project. A discussion of design trends and

technology in the surf, skate and snowboard cultures, followed by a discussion of design techniques, forms a central part of this account. Furthermore, the influences provided by contemporary designers including Tom Dixon, Ron Arad, Marc Newson are also identified to illustrate the context and sources of inspiration for the body of work.

The design and production process is then considered, including a discussion of the processes utilised in the design and production of each individual piece of furniture. Design difficulties are also identified to highlight the experimentation and investigation of various production and contemporary fabrication techniques undertaken in order to resolve these dilemmas.

Finally, the relevance and significance of the body of work is alluded to, as is its general contribution to the field of contemporary furniture design.

2.0 INSPIRATION AND MOTIVATION

2.1 INTRODUCTION

In approaching this research project, a number of influences have proven particularly important. These include the influences which motivated me throughout my youth, such as the surf, skate and snowboard cultures, and those which have emerged throughout my University studies and motivated my designs, such as my interest in Japanese culture and the notion of interactive furniture. Furthermore, the influences provided by contemporary designers including Tom Dixon, Ron Arad, Marc Newson are also identified to illustrate the context and sources of inspiration for the body of work I designed and developed.

2.2 INITIAL INSPIRATION AND MOTIVATION

My initial introduction to the world of design was through surfing, skateboarding and snowboarding. These sports are not only primary influences in contemporary culture, but also constituted a large proportion of the influences in my younger life. Technology has also been an important influence and given its association with these sports and street culture in general, it is relevant to discuss these factors simultaneously.

2.2.1 The Development of Contemporary Surf Culture

My interest in design stems from an incessantly curious mind, particularly where surfing is concerned. Conversations with older surfers regarding the different styles and shapes of their boards introduced me to the concept of 'design'. While examining the different surf conditions, they would explain the necessity of using a certain type of board in order to achieve optimum performance. As I developed my own surfing skills, I realised that while environmental factors were important considerations in the development of surf designs, performance and style were also

instrumental. Hence the development of specific boards for different styles of surfing.

Short boards, for example, are designed for high performance (refer to Figure 2.0). While their name suggests a short length, the boards vary in length according to the size of the surfer and the wave.¹ Long boards, or 'Malibus' as they are colloquially termed, are the more traditional design of board and are often preferred by surfers of older generations (refer to Figure 2.1). They are also more appropriate for smaller waves and are not as dynamic as the shorter, trick boards.² Essentially, the difference between the two boards is the style of surfing pursued when using them. Short boards allow the surfer to become one with the wave due to their ease of control. The surfer can position their board onto parts of the wave in a way other boards cannot be positioned and they further allow a more dynamic style.³ Conversely, long boards do not allow the surfer to become one with the wave. Due to their size, they turn more slowly and consequently, have to be positioned more carefully by the surfer in order to continue on any given wave.⁴ In this way, the surfer and the wave remain separate.

¹ Ridgway. N (Ed.) (1998) *Waves Surfing Magazine*. Australia: EMAP Australia Pty Ltd. 1998. p. 16

² Ibid., 1998. p. 15

³ Ibid., 1998. p. 16

⁴ Elliss. R (Ed.) (1994) *SW Surfing Magazine*. Australia: Breaker Publications Pty Ltd. 1994. p. 39



Figure 2.0 Short Board.



Figure 2.1 Long Board.

As the surfing industry has developed, so too has the design of the boards themselves. Hybrid boards, which are a cross between long boards and the smaller performance boards, were designed in the 1960s and have continued to evolve ever since (refer to Figure 2.2).⁵ They developed as a result of surfers experimenting with different shapes in order to achieve different surfing results. While their popularity diminished somewhat, they are presently being revitalised in order to ensure surfers can have more choices. These boards are often referred to as the ‘fun board’ and are ideal for the surfer who can never have enough boards.⁶

⁵ Doherty, S (Ed.) (1997) *Tracks Surfing Magazine*. Australia: EMAP Australia Pty Ltd. 1997. p.10

⁶ Ibid., 1997. p. 10



Figure 2.2 *Hybrid Board.*

In many ways, the research and design process I have undertaken as part of this research project is not dissimilar to the act of short board surfing. That style of surfing requires the surfer to know his/her equipment, to have precise judgment and finally, to possess spontaneity and confidence. Before proceeding into the surf, the decision must be made as to the type of board to be used and this decision is made by examining the type of wave to be ridden. A solid knowledge of both the equipment and the environmental factors, namely the type of wave, is essential in order to achieve the expected level of performance. Once the surfer is in the water, he/she experiences many elements that determine how a wave is to be ridden. First, the surfer must attempt to catch a 'set' wave. This is a group of waves that are generally larger than the common waves which break at the beach. Sets occur infrequently, usually between five and twenty minutes. Once a surfer catches a set, the spontaneity and precise judgment becomes essential. Surfing can be picture perfect; paddling onto a wave, standing up, looking down the line of crystal blue water, the sun glistening and creating reflections on the surface, dolphins riding the same wave, the wave barreling over the top of you to create a crystal tunnel where you can remain hidden and totally removed from the world. This is,

essentially, the perfect wave and further, it expresses what the majority of people consider to be surfing. However, surfing is rarely like that, unless the surfer is a professional and travelling the world in search of perfect waves every day. While precise judgment is important to ensure the most appropriate wave is selected and technique is used to ride it, spontaneity is essential as the waves and conditions are not dependable. The surfer must use their knowledge of the equipment and the environment around them, their judgment, and more importantly, they must remain spontaneous and try differing approaches each time in order to achieve their best performance in continually changing conditions.

I can relate the act of surfing to how I design. For example, the initial decision of what type of design to pursue; seating or lighting, is comparable to the decision to actually enter the surf or not. My choice of fabrication technique; either plastic moulding or timber lamination, is like the decision to use a short or long board. My knowledge of this equipment enables me to visualise the end product as the choice of technique invariably governs the style of the piece of furniture. That is, if plastic moulding is used, the finished product will have a contemporary feel about it, a direct result of the use of more modern equipment and technology. In much the same way as a short board allows a surfer to carve and use the face of the wave to do radical fast moves, quick turns and tricks, the plastic allows me to create more difficult shapes with ease and further ensures different textures can be explored. Conversely, if timber lamination is the fabrication technique of choice, the final product is far more predictable and traditional. It is clearly the 'safer' option of the two methods, like choosing to ride a long board. The long board would limit the use of a wave, but would ensure a safer and easier ride. Regardless of which technique is used, it is essential for me to apply precise skill and judgment when designing and making

the furniture. Nevertheless, it is also important for me to remain spontaneous as novel ideas often emerge as a result and can completely change the shape and style of the finished product.

The process of designing and construction of surfboards can also be related to the way I design furniture. Essentially, surfboard shapers buy what is termed a 'blank'. This is the basic foam core of the surfboard and they have a very minimal amount of work done to them as they are extracted from a mould. The shaper then takes the blank and proceeds to shape it. This process can take anywhere from two to five hours. Once the blank has a form, selected graphics are added and a fibreglass process follows. Finally the board is sanded and polished before being sold. Design and construction of the *6S Seat and Tables* (2000), is comparable to the process described above. The form was made using plastic pieces that required shaping. A basic dome or half-spherical shape was made using a rotational moulding technique and the internal arcs were then removed. Finally, the form was sanded and polished. In both examples, the final products resulted from materials without form that were moulded using mass-production procedures. The forms were then finalised using hand-crafted design techniques.

2.2.2 The Development of Contemporary Skate Culture

While an individual sport in its own right in modern times, skateboarding is actually derived from surfing. Skateboards were initially designed for use when there was no surf so surfers could, effectively, surf the streets. The first skateboards were derived from apple-crate skate scooters between 1918-1948 and in 1958 the apple-crate was modified to resemble a modern-day skateboard.⁷

Also in 1958, a southern California newspaper reported that wood-shop students were making timber skateboards as class projects.⁸ Nevertheless, there is a contention amongst earlier generation Australian surfers that they had been developing skateboards to use on the streets far earlier than this time, as the literary reference below suggests:

‘...John Milius, a local surf-type rode a skate over to visit Torger Johnson’s sister. Milius went on to author the screenplay for ‘Apocalypse Now’ and directed the films ‘Big Wednesday’ ‘Red Dawn’ and ‘Conan the Barbarian’. Johnson became an international champion, pioneered the space-walk, and disappeared under mysterious circumstances in the Sandwich Islands.’⁹

Regardless, there appears to be no documented evidence proving whether American or Australian surfers created the first skateboard.

By 1961, the first skateboards were produced and sold for profit in backyard sheds. Soon after, the first shop-assembled skateboards emerged and were sold from anywhere between three and twelve dollars (USD).¹⁰ At this time, surfboard shapers threatened to stop supplying surf shops with boards, claiming the shops had begun to resemble toy stores. Nevertheless, the popularity of skating increased and by 1964, the first sponsorship emerged. *Hobie Alter Skateboards* were backed by Vita Pact Orange Juice, Baron Hilton’s company, and Hilton’s sons became team riders for *Hobie Alter*.¹¹

In 1965, the first moulded fibreglass boards were produced and with their herringbone textured deck, integral reinforcement

⁷ Stecyk. C (1999) *Dysfunctional*. Great Britain: Booth Clibborn Editions. 1999. p. 7

⁸ Ibid., 1999. p. 8

⁹ Ibid., 1999. p. 9

¹⁰ Ibid., 1999. p. 9

¹¹ Ibid., 1999. p. 10

beams and manufacture's decal, they represented the high watermark of surfing industrial chic.¹²

Since that time, skateboards have undergone many design modifications, including the use of plywood, the introduction of kick-tails, concave surfaces, nose-kicks, special deck grips and protective guards (refer to Figures 2.3–2.6).



Figure 2.3 *Skateboards (1970s).*

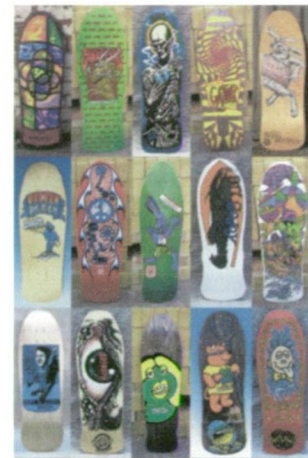


Figure 2.4 *Skateboards (1980s).*



Figure 2.5 *Tony Hawk Classic Style (1980s).*



Figure 2.6 *Skateboards (1990s).*

The development of skateboards was clearly influenced by the long established surf culture of the time. Essentially, skateboards enable the inland dweller to adopt the surfing persona whilst 'surfing' the inland streets.¹³ From those early times, the interest in skateboarding has only intensified and presently, it has become

¹² Stecyk, C (1999) *Dysfunctional*. Great Britain: Booth Clibborn Editions. 1999. p. 11

a major pastime for surfers of all ages and suburban youth. While skateboarding was initially influenced by the surf culture of the time, a role reversal appears to have occurred as the skate culture of modern times has had a major influence on the design and development of new surfboards.¹⁴ Furthermore, it has also influenced the development and introduction of a relatively new sport known as snowboarding.

Of interest is the fact that skaters and surfers alike have played a major role in the artistic and creativity communities over the years, being involved in both the film and music industries. For example, surfer Mike Sailsbury has also worked as a film design director on the set of *Jurassic Park*.¹⁵ Furthermore, skater John Van Hammerveld designed album covers for the *Beatles* and *Rolling Stones* and also designed shop fittings (interiors and exteriors) for the *In and Out Burger* chain of restaurants.¹⁶ Dean Torrance and Jan Berry also contributed with their international musical hit, *Side-walk Surfing*, in the 1970s.¹⁷ Skaters and surfers have also become involved with the art movement itself, as the extract from Craig R. Stecyk 3rd's essay suggests:

'Derrick 'Skipperboy' Engblom, *Makaha* team-leader, makes custom skateboards for profit in his Santa Monica garage. The hand-shaped and painted skates he creates in the 1980s will be embraced by the functional fine arts movement along with the constructions of another ex-*Makaha* coach, James 'Jimmy Z' Ganzer. The third *Makaha* leader, the 1969 world surfing champ Mike Doyle, has to settle for merely being lionised in international gallery spaces as the great hope of neo-exaggerated impressionism. Doyle commented, 'I always thought that the function of art was to be art.' One of

¹³ Stecyk, C (1999) *Dysfunctional*. Great Britain: Booth Clibborn Editions. 1999. p. 11

¹⁴ Ibid., 1999. p. 12

¹⁵ Ibid., 1999. p. 13

¹⁶ Ibid., 1999. p. 13

Mike's misdirected inventions was the single ski (snowboard); a device that generated little interest among Alpinists when originated. In the 1990s, however, virtually all major ski makers will begin marketing the single ski.¹⁸

The fact that so many skaters and surfers have been involved in various art forms over the years demonstrates the creativity associated with these sports. In this way, I can relate these sports that were so influential in my earlier years, to the art and design that motivates me today. Essentially, the streets or the ocean are like a blank canvas or an un-shaped piece of timber and the skaters and surfers, by applying specific tricks and manoeuvres, create a new design or a piece of art in much the same way I take plastic or timber and apply design techniques to create a new form.

2.2.3 The Development of Contemporary Snowboard Culture

The most recent sport to emerge from the earlier surf culture is snowboarding. Essentially, this sport contains a mixture of surfing and skateboarding techniques and design as it relies on both manufactured and hand-made processes in order to construct the board. Furthermore, it relies on both the forces of nature and actual skill in order to manoeuvre the board appropriately.

There are two major types of snowboarders. The first are known as 'free riders' and these people generally snowboard, or 'surf' the mountains. The other type are termed 'freestylers' and these people snowboard on specially designed snow-parks with ramps and bowls, performing tricks that are based on skateboarding manoeuvres. Snowboarding, like surfing and skating, has used

¹⁷ Ibid., 1999. p. 13

¹⁸ Stecyk. C (1999) *Dysfunctional*. Great Britain: Booth Clibborn Editions. 1999. p. 14

design to advance and enhance its development. The initial boards were created from plywood planks with simple straps acting as bindings to hold your feet to the board. Presently, the boards are constructed of innovative materials including plastic honey-combed fibreglass cores and they used far more advanced 'click-in' binding systems that reduced the amount of time and labour required to use the older 'strap' system.

Not only has snowboarding become the fastest growing sport in the world, it has also developed as the most technologically advanced board sport. These accolades come only ten years after its inception as a legitimate sport as it was shunned and disallowed at most ski resorts until then. It now constitutes forty per cent of the activities undertaken at ski resorts around the globe.¹⁹

The dynamic nature of snowboarding and the technology associated with the equipment involved is clearly inspirational. Furthermore, the speed with which its popularity has emerged highlights the importance of novel inventions. While they can be shunned and considered inappropriate, more often than not, such designs become so ingrained in contemporary culture, that it is difficult to remember a time when they were not present. This type of philosophy has been particularly motivational as my career as a designer has evolved.

2.2.4 The Influence of Contemporary Surf and Skate Culture

The retail outlets which sell contemporary surf, skate and snowboard equipment and merchandise have also had a profound influence on my style of design. Their vibrant atmospheres, bright lights and usually loud, current music make the stores

¹⁹ Stecyk, C (1999) *Dysfunctional*. Great Britain: Booth Clibborn Editions. 1999. p. 17

inviting, especially to the younger generation of surfers, skaters and snowboarders. Upon entering one of these stores, the colour and repetitive style of advertising almost assaults your senses. The walls are usually covered with an eclectic collection of posters, stickers and flyers, however the racks displaying the designer clothing are impeccably neat, colour co-ordinated and very repetitive. Similarly, the neatly assembled racks of surf, skate and snowboards are visually pleasing and very influential in enticing customers.

This example of modular form was one of the earliest I recognised and the observation helped me realise the profound visual impact of modular design. It demonstrated to me that the production of products in multiples, regardless of whether it is clothing, boards, furniture or cars, could create an interesting and enticing image when the forms are presented together or in close proximity to each other. Hence my development of a range of furniture based on the notion of multiple configuration.

Nevertheless, it is important to note that while a rack of surf, skate or snowboards look identical and appear as if they have just rolled off the conveyer belt of a production line, they still have a hand-man aspect to them in that they were initially hand crafted. This creates a sense of individuality as it is the use of the designer's hand that provides the difference. In designing my own body of work, there remains a hand-made aspect as each piece is individually cut, sanded and polished in the same way a surfboard or skateboard is. As such, the furniture may appear machine manufactured, however, they retain the mark of the designer's hand and my consumers therefore receive a limited production, hand-made form. Furthermore, while all the boards may resemble each other in terms of overall design, it is how the surfer or skater interacts with the board and what they do with it

that makes it individual and different. I have attempted to achieve this ideal by designing a range of very similar furniture with the intention that it invites interaction. In this way, each person can react to the furniture differently and adapt or change the pieces to create individual configurations suitable for their own particular lifestyles and environments.

2.2.5 The Expansion of Surf and Skate Culture to all Facets of Contemporary Society

The surf, skate and snowboard cultures play an exceedingly important role in contemporary Australian culture and they have begun to influence all facets of society. All over Australia, retail stores hundreds of kilometres from any beaches or snow fields sell surf, skate and snowboard brand clothing, shoes, watches, luggage, accessories and promotional devices. No longer are these merely recreational sports. Rather, they have become commercialised fashion statements with a large proportion of Australian youth owning at least one item. The surf and skate design industry even employs designers from a range of fields for the production of shoes, watches, hats, wetsuits, swimwear, promotional devices, display racks, signs, advertising, shop fittings, as well as the regular equipment used in each of the sports.

One highly successful surf company that comes to mind is Australia's own *Mambo*. Most of the company's success can be attributed to one of their artists, Reg Mombasa, who has been designing for the company since its inception. His humorous and often slap-stick commentary regarding contemporary Australian society is reflected through his art and his designs have made *Mambo* products what they are today (refer to Figures 2.7 and 2.8). His designs initially appeared on clothing, however, they

now appear on all forms of merchandise including surfboards, skateboards and all sorts promotional and advertisement material. Three-dimensional recreations of his fictional characters are also used as part of shop fittings to promote *Mambo* and were further used in the opening and closing ceremonies at the Sydney Olympics.



Figure 2.7 Mambo - Beer-Tree Shirt.
(Design - Reg Mombasa).



Figure 2.8 Mambo – Wallet.

Mambo and surfing relate to each other not only through the connection that mambo was created as a surf clothing brand. The two also share the same common thread of rebelliousness to tradition and mainstream social values. They make political and social statements that youth culture can relate to. For example the shirt in figure 2.7 that shows a tree in the shape of Australia with a koala, Kangaroo and Wombat passed out underneath it. This shirt is a comment on one of Australia's favourite past times; drinking beer, it suggests that what is more important to us, money growing on trees, or beer. This humorous image is an obvious comment on an experience shared by many of the youth culture. When people buy such a shirt, what they are really buying and displaying to the world is their association with the image rather than merely the garment. This questions the primary and normal function of the shirt, clothing or personal statement?

What I am trying to create is furniture that people can relate to and that is also outside the typical norms of furniture, whether it be the bright visuals or the interconnected forms that bring on a

sense of excitement and fun. At the end of the day surfing, skating, snowboarding, Mambo, youth culture and my furniture are all about fun and fulfilling a need to be an individual.

Similar to Mambo, skate boarding's Tony Hawk has also made a highly successful name for himself in the skate industry. Upon turning professional at age sixteen, he has been used as a promotional tool to develop skateboarding to new heights. Not only is he the most successful all-time skater in terms of skill and technique (he was the first to land a *900 Air* which involves completing an aerial out of a ramp with a two and a half rotation of the body), but he also owns his own skateboard, clothing and shoe companies. Furthermore, he has been instrumental in the development of three *Play Station* skateboarding games, which bear his name and trademark skateboarding manoeuvres. Now every child and adult alike can be as accomplished at skating as the top professionals, without even leaving their lounge room.

It is therefore interesting to note that while surfing and skating were once considered sports for the rebels of society and the designs of companies and people like *Mambo*, Reg Mombassa and Tony Hawk were considered tasteless, their popularity and influence in contemporary Australia has developed to the point that an explanation of our culture would be incomplete without their mention. Clearly, this aspect of the surf, skate and snowboard cultures has been motivational in the development of my own designs. Using design as a form of expression to create bodies of work that actually inspire and influence aspects of people's lives is a powerful notion and something to aspire to.

2.2.6. Final Remarks

Surfing, skateboarding and snowboarding motivate me because they are all forms of design that are highly functional and precise,

yet they still offer a level of entertainment. While the boards use design for function, aesthetics play an important role in creating a personalised look for the board and in ensuring an individual style in the terms of the way the board performs. Similarly, I enjoy designing and creating forms that serve a specific function, but are still aesthetically pleasing and provoke consumers to entertain themselves by interacting with them. The forms I create pay close attention to subtle changes in the design process and this consequently changes the overall aesthetic and function of the piece. Like surf, skate and snowboards that require people to be in-tune with their boards, my furniture seeks to ensure that consumers become so 'in-tune' with it, that subtle changes in the design, along with individual interaction, will allow the furniture to function differently in any given environment.

At the outset of this research project, I drew upon the influences of my youth and decided to design my own surfboard. I felt that this project would not only allow me to experiment with the technology associated with shaping boards, but would enable me to design a personalised board (refer to Figure 2.9). After beginning, I found myself trying to reinvent the wheel and as such, I treated the board like I would a piece of furniture. While considering both classic and contemporary boards, I went about creating a design that, despite having a specific function, looked different to those designs of the past. Given the surf in Tasmania is fairly small, this factor was a primary consideration when designing the board. Small waves require a wider and thicker board to ensure it remains buoyant. The shape of the board is also quite different. It is totally elliptical in the plan view with the nose and tail the same shape. The shape was so different and interesting that it inspired me to carry it through to the furniture I was designing as part of this research project. Furthermore, the fact that the board had no straight lines was also a motivational

factor and it prompted me to consider the uses of curves as opposed to straight, conventional lines in my body of work. Thus, the inspiration from my youth to design and develop a surfboard and the actual process of constructing the board had a profound impact on the body of work I decided to develop for this research project.

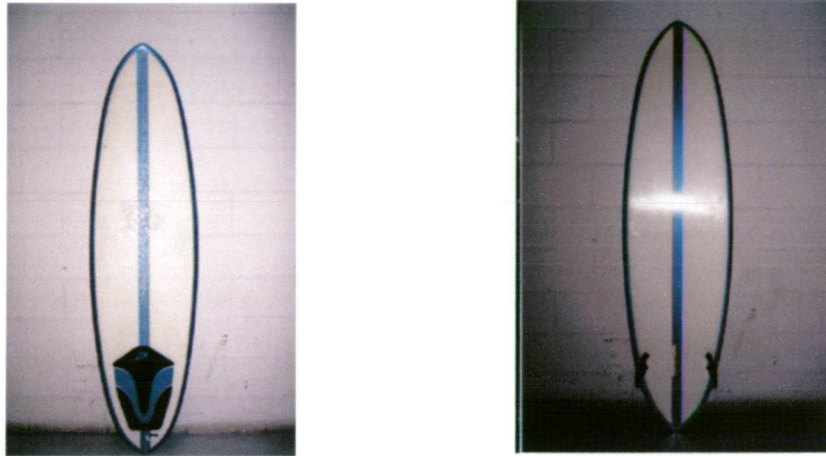


Figure 2.9 *Surfboard* (2000) – My own design and construction.

2.3 SUBSEQUENT INSPIRATION AND MOTIVATION

Throughout my time at University, my interests and work experiences have reversed in importance. Previously, I was completely absorbed in surfing, skating and snowboarding, spending much of my school holidays and spare time at the beach, the snow or skate parks. Design, or at least an interest in design, was merely a hobby and I spent a little time constructing and reconstructing models, painting my own designs on the models, designing features for t-shirts, plaiting leather to create a variety of interesting forms and experimenting with the wood lathe. Over the course of the past few years, however, my interest in design has become a passion and my chosen career path. Surfing, skating and snowboarding are now very much hobbies as I spend the majority of my time designing and experimenting with new fabrication techniques. Essentially, the hours I used to spend waiting for the perfect wave or hiking up a

mountain to get the best run down on my snowboard, are now spent fine sanding and finishing pieces I have designed and constructed.

Consequently, while surf, skate and snowboard culture and technology remains particularly influential, as discussed previously, I have discovered a range of other cultures and techniques that have also become influential and motivational.

2.3.1 The Influence of Japanese Culture

During 1996-1998, I completed a Bachelor of Fine Arts at the University of Tasmania, majoring in Furniture Design.

Throughout the degree I was highly influenced by contemporary, minimal Japanese design and architecture. It was through these influences that I discovered the notion of connection and adaptation of furniture. By 1998, the final year of my Bachelors degree, my research into Japanese style and contemporary living uncovered the somewhat simplistic notion of changing the home, including the furniture, art and garden, to suit such things as the change of seasons, business dinners or cultural events. This culture has been practiced for centuries in Japan and the idea of having options with regard to the layout of your house, in particular, your furniture, was really appealing to me. It challenged the 'single-purpose', 'single-function' stigma that is often attached to furniture and I liked the idea of being able to create furniture that was functional, yet had the ability to be changed or adapted according to individual perceptions and needs.

My *Twin Curve* (1998) range of furniture was my first attempt at using connection in design to create adaptable furniture. The furniture was designed for a contemporary fashion boutique with the intention that it would be adaptable enough to accommodate frequent changes to the boutique's interior. Continual changes to

the interior not only accentuates certain fashions and new season's designs, but has the economic benefit of provoking curiosity and enticing passing customers.

The *Twin Curve Seat* (1998) (refer to Figure 2.10) was my first successful attempt at creating a piece of furniture with multiple functions. The seats can be placed together or separated. The backrest is also optional and doubles as a rack for displaying fabrics, accessories or clothing.



Figure 2.10 *Twin Curve Seat* (1998) - Leather, foam and stainless steel.

2.3.2. Introduction to the Notions of Flexibility, Duality and Transformation in Furniture

During 1999, I completed the Honours component of my Bachelor of Fine Arts. I extended my interest in creating adaptable furniture by focusing the body of work on the notions of flexibility, duality, transformation and contemporary living. The range of furniture was designed for young, career oriented people for utilisation in contemporary inner-city apartments. The central design feature was that the furniture could be easily adapted and transformed to meet individual needs and the frequently changing environments people live in. Given the stark and somewhat uninviting impressions modern minimal furniture of the late 1990s appears to provide, my intention was to also create furniture that provoked interest and attention.

The *Two Door Cabinet* (1999) (refer to Figure 2.11) was designed with the dual function of acting as a cabinet, or being

adapted slightly to double as a room-dividing screen. The curved back and front of the cabinet further provide a positioning option. That is, it can be quite suitably placed in the middle of a room or in a corner. The two doors act as a room-dividing screen when opened simultaneously.

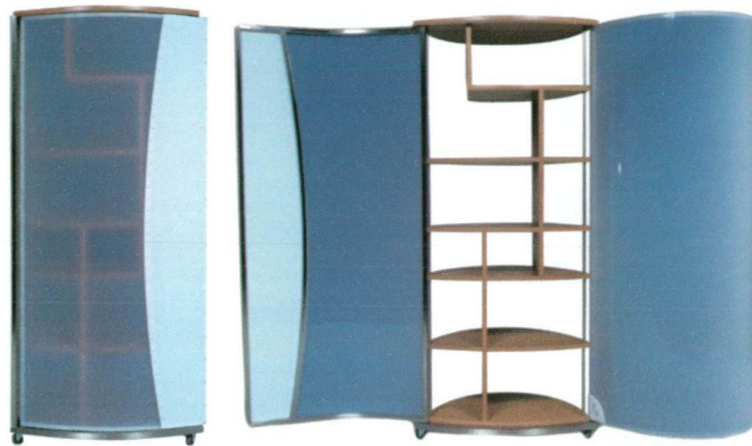


Figure 2.11 *Two Door Cabinet* (1999) - Timber, stainless steel and acrylic.

The *SOS Boxes* (1999) (refer to Figure 2.12) are a storage system also designed and created as part of the body of work for the Honours component of my degree. In this context, the term ‘SOS’ means ‘slightly off square’ and the boxes were designed with the intention of demonstrating just how versatile a simple form can be. The forms have multiple functions and can be used as a multi-positional shelving unit, seat and small table. The choice of bright, inviting colours was a primary developmental consideration as my intention was to engage people to interact with the boxes by changing their positions or stacking them in much the same way a child plays with building blocks. While I envisage the boxes being mass-produced in bright coloured plastic, in this instance, the prototype boxes were constructed from MDF and sprayed with a durable lacquer. New fabrication techniques using plastic were explored, as the body of work designed for this research project demonstrates.

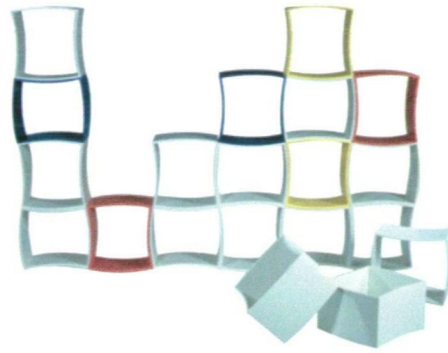


Figure 2.12 *SOS Boxes* (1999) - Laminated MDF and lacquer.

2.3.3. Final Remarks

Clearly, the ranges of furniture I created in 1998 and 1999 have had an undeniable influence on the body of work I have designed and created for this research project. This is particularly true of the *SOS Boxes* (1999). The idea of taking a square and changing its form by including alternating concave and convex arcs became very inspirational. It proved that even simple forms can be exciting and further, very versatile. These notions of simplicity and versatility became the impetus and aesthetic behind the body of work I created for this research project. Constructing multiple forms from a single design confirmed my expectation that mass-production of my own designs was achievable. The successful use of colour in my earlier ranges of furniture further encouraged me to use bright colours and look into producing plastic objects in this body of work. While the inspirations from my youth have remained motivational, my new found interests through the development of my own design style are clearly evident in the approach I have taken in creating the range of furniture for this research project.

2.4 INSPIRATION AND MOTIVATION FROM RELATED DESIGNERS

Designers of the current era are creating furniture that challenges traditional forms and this has had a profound impact in motivating the work I have designed for this research project. In contemporary times, designers are not limiting themselves to furniture design alone. Rather, they are applying design techniques to everything, including object, industrial and craft design. Naturally, a host of furniture/industrial designers have influenced this project. Furthermore, specific functional aspects of buildings have also proven influential. Essentially, three separate, but equally important groups of designers have inspired my range of furniture. These include international contemporary furniture designers that use connection and multiple modules in their work, Japanese minimalist designers, and finally, those that design and create for public spaces.

2.4.1 International Contemporary Designers

I believe the key designers that fall within this category are Tom Dixon, Ron Arad and Marc Newson. Their use of materials, seamless objects and ability to successfully humanise design has proven inspirational. This humanisation of design is achieved by the use of form that has anthropomorphic connotations such as soft or organic shape. Such forms can often generate a 'psychological' and 'emotional' comfort, as well as an 'ergonomic' comfort and sense of well-being.

a. Tom Dixon

Tom Dixon's use of plastic and multiple forms has interested me over the past few years. His work has evolved from welded sculptural structures in the mid 1980s to the early 1990s. The *Pylon Chair* (1991), which was influenced by the spoke wheels of B.M.W motor bikes, is a primary example (refer to Figure

2.13). This chair was created from welded pieces of metal rod and despite its ease in construction, it was a particularly timely exercise. Subsequent to his experiments with metal, Dixon has moved on to producing curvaceous plastic manufactured furniture. A *Vogue* journalist wrote in the mid 1990s:

‘Whatever mainstream designers are up to, Tom takes pleasure in the opposite line. He has proven that designer craft is alive and well. He has also shown that it doesn’t have to cost thousands of pounds a piece.’²⁰

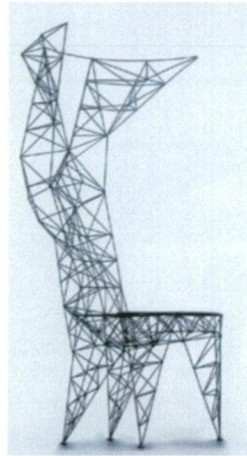


Figure 2.13 *Pylon Chair* (1991) (Tom Dixon) – Welded steel.

Dixon’s work has evolved from the one-off craft/design objects to production furniture. Nevertheless, he has never abandoned his roots in the sculptural steel structures that have been so prominent in his pieces since the early 1980s. Elements of the seemingly random state of his earlier work still remain in his most contemporary works and this work appeals to me the most. His use of plastic and connection within his designs have proven particularly motivational and his *Jack Light* (1996) and *Euroblocks* (1998) are examples of the use of these techniques (refer to Figure 2.14).

²⁰ Sparke, P (2001) *Design Directory Great Britain*. Great Britain: Pavilion Books Ltd. 200. p. 164



Figure 2.14 *Jack Light and Euroblocks (1996)* – Moulded plastic. *Euroblocks (1996)* appear in the background while the *Jack Lights (1996)* appear with the people in the foreground.

Dixon's *Euroblocks (1996)* were created for Eurolounge, one of his own manufacturing ventures. This simple cubic light can be used as a screen or simply scattered and stacked to form a soft feature light. The light has been made with input and output connections on the backside to ensure ease in connecting and disconnecting power from the light. The *Jack Light (1996)* was also created for Eurolounge and is constructed from six rolled over cone forms that are connected at three different axes. It is a primary example of multiple forms of functional furniture that invite consumers to change the configuration to suit their own personal needs. The lights can be stacked vertically, positioned along side one another or placed randomly by themselves to use as lights or seating (refer to Figure 2.15). Furthermore, the light is produced from injection moulded plastic which ensures relative ease in mass-production and cost effectiveness. This light provided the underlying influence for my *MLS Light (2001)* which has proven to be one of my most versatile designs to date.

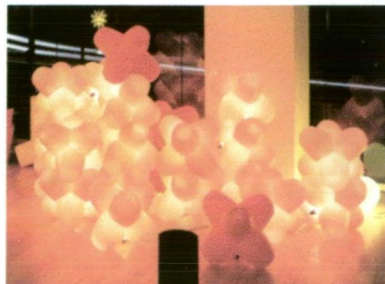


Figure 2.15 *Jack Light (1996)* (Tom Dixon) – Injection moulded plastic.

Dixon's current work was showcased at the *Milan Furniture Fair* (2000) and at various exhibitions throughout Australia in 2001. He also teamed up with *Domus Magazine* to form the *Domus Design Factory*. The purpose of this was to exhibit and demonstrate the capabilities of his specially imported plastic extrusion machine (refer to Figure 2.16). Dixon discovered the machine when visiting *Gabriele Chamie*, an Austrian company specialising in the mixing of colour for plastic works. The company uses a small-scale extrusion machine to test colour mixes. This is achieved by placing various mixes of coloured pellets in the machine which then produces strands of mixed colour plastic. Dixon was inspired by the machine when he discovered the lumps of organically shaped plastic that formed when the machine was allowed to drip clean to remove any remaining pigment. He appreciated the randomness of this procedure and used it to produce legitimate objects (refer to Figures 2.17 and 2.18). The technique does, however, have its limitations as it is next to impossible to create the same piece twice. Nevertheless, this very limitation was what attracted Dixon.

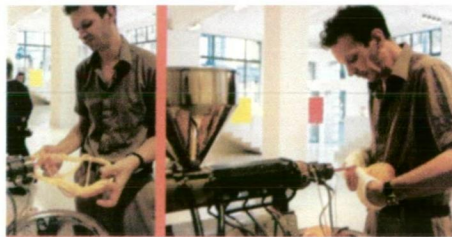


Figure 2.16 *Plastic Extrusion Machine* – demonstration by Tom Dixon.



Figure 2.17 *Lights* – Extruded plastic.



Figure 2.18 *Objects* – Plastic.

Interestingly, Dixon encouraged people to interact with his work by being involved in the production phase. He allowed people to experience using the extrusion machine to create various objects that were then displayed with works by other renowned designers. This notion was clearly inspirational to me as I have also attempted to break down the barrier between designer and consumer by creating a range of furniture that encourages interaction.

b. Ron Arad

Ron Arad has also proven inspirational over recent years. Like Dixon, Arad began creating furniture from welded steel. He used bent and contorted sheet metal for most of his early work, generally seating, and it is through the use of these techniques that his raw, industrial aesthetic was established. The piece I find most motivational is the *Big Easy Volume Two* (1988) (refer to Figure 2.19).



Figure 2.19 *Big Easy Volume Two* (1988) (Ron Arad) - Welded steel.

By using hollow-formed hard steel, Arad mocks the traditional over-stuffed, plush armchair. Despite the same common form, no two of these chairs are identical as welding and polishing by hand ensures slight differences in the finish. Arad has also adopted the notion of interaction in the production of these chairs. They are partly filled with sand and this allows people to

shift the centre of gravity of the chair to the requisite position. Again, this notion has inspired the adaptability and interaction my range of furniture invites.

Throughout his career, Arad has adapted and evolved his fascination with the use of sheet material to move from a raw industrial feel to a more sophisticated highly finished aesthetic. Some examples of his more contemporary furniture are the *Tom Vac Chairs* (1997) and the *B.O.O.P.S Range* (1998) (refer to Figures 2.20 and 2.21). The *Tom Vac Chair* (1997) uses vacuum formed aluminium, while the *B.O.O.P.S Range* (1998) are constructed from blown formed aluminium. The *B.O.O.P.S Range* (1998) has also become *Baby B.O.O.P.S* for the production of small bowls for *Alessi*.



Figure 2.20 *Tom Vac Chairs* (1997) (Ron Arad) - Aluminium and steel.



Figure 2.21 *B.O.O.P.S Range* (1998) (Ron Arad) - Aluminium.

Two of Arad's more influential pieces are his *Bookworm* (1994), designed for *Kartell*, and his *H Shelving Units* (1998) (refer to Figures 2.22 and 2.23). The *Bookworm* (1994) is constructed from a flexible translucent plastic strip with 'book' wall brackets. These brackets enable the unit to be positioned in a myriad of different ways, depending on the individual requirements of the consumer. Similarly, the *H Shelving Unit* (1998) is also designed for free and unrestricted interaction. This notion of interaction has emerged through Arad's designs and has yet again proven a source of important inspiration for the design of my range of furniture for this research project.



Figure 2.22 *Bookworm* (1994) (Ron Arad) – Plastic (two configurations).

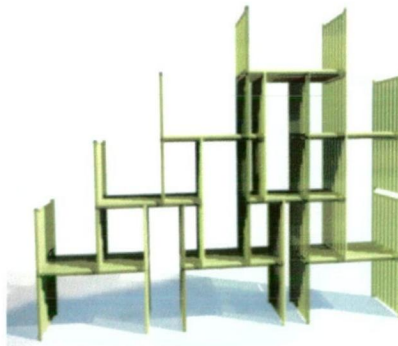


Figure 2.23 *H-Shelving Units* (1998) (Ron Arad) - Plastic.

c. Marc Newson

Marc Newson has also been a valuable source of motivation as not only is he one of the world's leading designers, he is an

Australian. Newson's use of bright colours and his continual manipulation of the same form have clearly inspired my furniture as I have also attempted to create a range that is based entirely on the same form.

Newson's first major pieces were constructed from metal and aluminium and his *Lockheed Lounge* (1986) is probably the most recognised (refer to Figure 2.24). It is constructed from fibreglass clad in aluminium in an attempt to recreate the outer shell of an aeroplane. Hence the name, *Lockheed Lounge*.

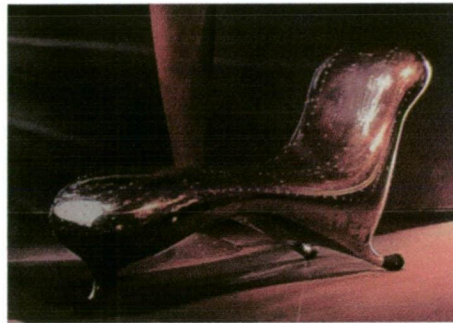


Figure 2.24 *Lockheed Lounge* (1986) – Fibreglass and aluminium.

Newson's designs developed to include brightly coloured plastic technology and it is from here that I have drawn inspiration for my use of colour in the range of furniture I created. Works such as the *Orgone Lounge* (1989) and *Orgone Chair* (1993) are prime examples (refer to Figures 2.25 and 2.26). Newson wrote in reference to his *Orgone Lounge* (1989):

‘...I envisioned this as the *Embryo Chair* [(refer to Figure 2.27)] squashed flat by a steam-roller.’²¹

²¹ Rawsthorn, A (1999) *Marc Newson*. Great Britain: Booth-Clibborn Editions. 1999. p. 123 (Quote: *Marc Newson*).



Figures 2.25 & 2.26 *Orgone Chair* (1993) & *Orgone Lounge* (1993) – Plastic



Figure 2.27 *Embryo Chair* (1989) - Steel, polyurethane and neoprene.

As discussed previously, the majority of Newson's work is based around adaptations of the *Orgone Shape* (hourglass shape). In this way, his work has originality, a type of 'thumb print', and yet consistency, as the same form is present to differing degrees in all of his work. I find this notion interesting as it not only ensures the individual pieces in a range can relate and interact with each other, but ensures a designer's work is easily recognisable and distinguishable for the work of other designers.

In contemporary times, Newson has shifted from the sole production of furniture to become a well revered designer of a range of products including home-wears, sunglasses, cars, bikes, jet plane interiors and interiors for pubs, clubs and clothing stores. Two of Newson's designs that are particularly innovative and

relate to my research are his *Candle Holders* (1993) and *Bucky Installation* (1995). The *Candle Holders* (1993) are a simple yet elegant design constructed from machined aluminium (refer to Figure 2.28). The rounded end of the candle holder has three holes which allow connection in a variety of different configurations. The slender end can be connected to the holder and positioned in a stationary manner. Alternatively, it can be mobile and used to carry a candle around. This modularity is clearly of interest to me given I have explored this notion in my designs over the past four years.

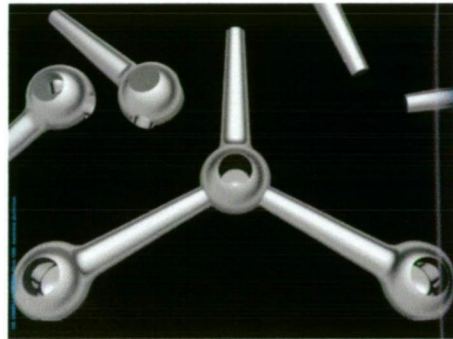


Figure 2.28 *Candle Holders* (1993) (Marc Newson) – Machined aluminium.

The *Bucky Installation* (1995) was designed for *Foundation Cartier*, the Paris Art Gallery. *Bucky* is a series of plastic seats that connect together to form a dome similar to the geodesic domes of *Buckminster Fuller* (refer to Figure 2.29). The installation is appealing as a relatively small singular object has the ability to become a large-scale installation when connected. Essentially, it evolves from a functional piece of furniture, to a huge sculptural object. As such, *Bucky* was a major influence on my design of the *6S Seats and Tables* (2000) as they can not only be used as furniture, but can be configured in a variety of different ways to create a more sculptural piece.

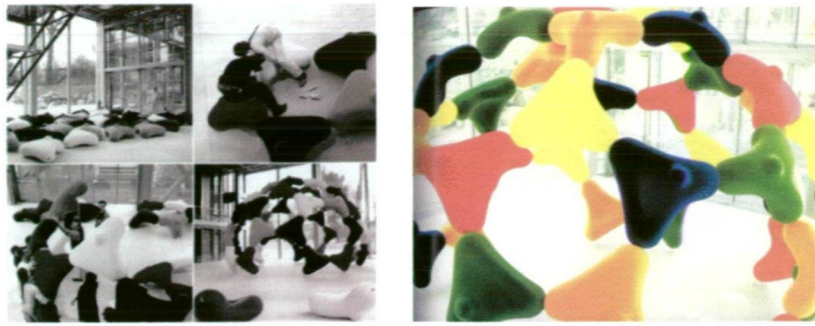


Figure 2.29 *Bucky Installation* (1995) (Marc Newson) – Polyurethane foam.

2.4.2 Designers of Public Spaces

Contemporary buildings and the use of public space has also been inspirational and motivational as the majority of the work I have produced in the past three years is designed for situation in public spaces. I have attempted to create ranges of furniture that can be used to brighten the otherwise dull interiors of public buildings, offices and retail outlets. Furthermore, the elements of adaptability ensures the furniture can be reconfigured often to create interest and to meet the needs of individual consumers and their environments.

Contemporary buildings have inspired me to create contemporary ranges of furniture and the *Learmouth International Airport* (2000) is one building that appeals to me both in terms of the interior and exterior (refer to Figure 2.31). Designed by architects Jones, Coulter and Young, the exterior resembles a modern day aircraft hanger. The bright interior consists of coloured walls and furniture and these vivid colours appear to ooze from the interior to the brightly coloured awnings and airfoil shaped louvers of the exterior.

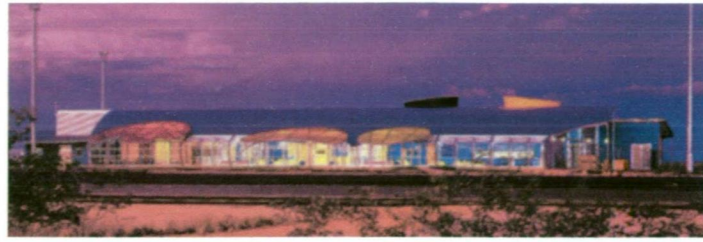


Figure 2.31 *Learmouth International Airport* (Jones, Coulter & Young).

The furniture in the building is interesting as it has the ability to break up and segregate what is otherwise a very open space (refer to Figure 2.32). The concept of multiple configuration is again present in this range of furniture as the repeated forms can be moved and changed with ease. While the furniture has the ability of breaking up the open space, it ensures a kind of freedom of space can be retained. I am inspired by the way the furniture can be moved and adapted to create a variety of different configurations and patterns and I have adopted this notion on a smaller scale in my own ranges of furniture over the past few years.



Figure 2.32 *Learmouth International Airport* (Jones, Coulter & Young).

Toyo Ito is also a particularly inspirational architect who has the ability to represent contemporary culture through his buildings. Ito's buildings are usually flowing spaces consisting of transparent and reflective mediums and he experiments with the dematerialising qualities of light. According to Ito, the human body exists on two separate yet equally important levels: the real, which is the primitive body that human beings have always

possessed, and the virtual, which is the body that has come into being with the spread of the media. He suggests that it is through these two bodies that we connect to architecture and the cities we live in.²² The concept of *Sendai Mediatheque*, a building dedicated to the electronic media, suited Ito's ideology and he was commissioned to design it. Completed in 2001, the media centre comprises of a café, gift shop, children's library, art culture library, audiovisual library, galleries, lounge areas and a theatre (refer to Figure 2.33).



Figure 2.33 *Sendai Mediatheque* (2001) (Toyo Ito) – Exterior view.

The building consists of three essential elements; floor plates, structural 'tubes' and a skin and it creates a visual feast for visitors. The thin honeycomb steel floor plates are skewered on thirteen distorted tubes of welded steel pipe. The tubes, or wormhole-like structures, act as circulation routes carrying people, light, energy, and air. A number of world renowned designers were invited to create the furniture for separate sections of the building. As such, architect Kazuyo Sejima designed the information centre and children's library, Ross Lovegrove developed the sixth floor multi-media studio, and Karim Rashid

²² Khiu. J (Ed.) (2000) *Monument Magazine - Design Special 2000*. Australia: Terraplane Press. 2000. p. 47 (Discussion: Toyo Ito).

created the furniture for the galleries and ground floor public plazas.

The idea of involving different designers to create the furniture for the different parts of the interior is an interesting concept. Ito designed the building with the intention that the available internal space be used to its maximum capabilities. Without furniture and fittings that have adaptable qualities, however, this could not have been achieved. Consequently, the furniture used offers flexibility on a grand scale. Unfortunately, the furniture within Ito's building does not offer ease of manoeuvrability owing to the size of the pieces. Nevertheless, Rashid's *Loop Chair* (2001) and the *Lovegrove Tables* (2001), designed by Ross Lovegrove, are constructed on a smaller-scale and do ensure interaction is not completely limited (refer to Figures 2.34 and 2.35).



Figure 2.34 *Loop Chair* (2001) (Karim Rashid) – Upholstered foam.

Figure 2.35 *Lovegrove Tables* (2001) (Ross Lovegrove) – Steel and laminex.

2.4.3 Final Remarks

Essentially, all the designers and architects discussed above are questioning or reacting to modernist design. They have used successful examples of design such as a basic chair, a shelving unit or a building, and humanised it to create more contemporary pieces and buildings that push the boundaries of the conventional and traditional uses of furniture and public spaces. Furthermore,

they have used novel fabrication techniques and materials to achieve this, including the use of colour, multiple form and mass-production manufacturing. Through using materials in different ways they were able to convey an understanding of current cultural issues, making it more accessible for people to engage with the products. As Penny Sparke suggests,

‘...this universal talent belongs to the cadre of new enlightened designers who play with the feelings and fantasies of consumers by transforming daring visions of the past into articles of the present.’²³

2.5 FINAL REMARKS REGARDING INSPIRATION AND MOTIVATION

All of the activities, cultures, technologies, designers and architects discussed in this section have been the source of great inspiration and motivation to me over the past few years, especially in the design and production of the range of furniture created for this research project. The use of colour and a single, adapted form in each of my individual pieces, along with the concepts of modularity, multiple configuration, and interaction that are central to my body of work clearly illustrate the inspiration sought from each the areas discussed in this section.

²³ Sparke. P (2001) *Design Directory Great Britain*. Great Britain: Pavilion Books Ltd. 2001. p. 278

3.0 THE DESIGN AND PRODUCTION PROCESS

3.1 INTRODUCTION

The body of work completed for this research project was developed using machine factory production processes. The decision to utilise this method of fabrication was made, not only with regard to the fact that the work was based on the principles of multiple configuration, but to further my knowledge of production techniques. While the designing of furniture is an integral part of the development process, I believe that the design phase should consider the type of production technique that will be used and as such, I designed this range of furniture around specific production techniques and processes. The motivation behind my experimentation and exploration of the production processes and techniques used throughout this research project is encapsulated in the statement by Ron Arad, referring to his understanding of the reason for designing:

‘the point of design is...to do something seriously,
genuinely new, whether this newness is in materials,
process, function or anything else.’²⁴

In response to this statement, the research I have undertaken attempted to tackle various production processes, functions and techniques. Furthermore, manufacturing processes designed for industrial products were also researched and some of these techniques were adopted and adapted to utilise in the production of this body of work. Once such technique is rotational moulding. In Tasmania, this process is currently used in the production of durable water tanks and other water flotation devices. By adapting this technique, I was able to use it to produce many of the pieces of furniture in the range.

²⁴ Khiu. J (Ed.) (2000) *Monument Magazine - Design Special 2000*. Australia: Terraplane Press. 2000. p. 47 (Quote: Ron Arad).

3.2 THE DESIGN AND PRODUCTION PROCESS

3.2.1 Computer-Modelling

The design process I used in completing this body of work commenced with, and was largely based upon, computer technology. All the individual pieces of furniture were designed using *ZOOM*, a computer-modelling program. This allowed me to explore curved forms and to experiment with different variations of the forms in order to resolve any visual and technical issues. For example, in designing the *6S Seats and Tables* (2000) and the *MLS Lights* (2001), the size and angle of dissection had to be taken into consideration. The *ZOOM* program enabled me to experiment with the angles and widths before any manual dissection commenced. The program eliminated much of the later trial and error process I would have had to undertake later in the production stage. As such, the program is not only a time efficient alternative, but also cost effective, particularly when dealing with complex forms like those used in this range of furniture.

3.2.2 Rendering and Animation

Once the initial designing was complete, another computer-modelling program, *Artlantis*, was used to render the designs and create moving animated pictures of each individual piece. This process enabled the model to be viewed from all possible angles, and further allowed experimentation with colour and texture.

3.2.3 Production Research and Mock-ups

Fabrication and production processes were then researched and considered, along with experimentation with various materials. Mock-ups of each design were also developed in order to test the

technical viability of the piece and to further ensure safety, comfort and other aesthetic qualities.

3.2.4 Pre-Production Preparation

Once the designs had been finalised for production, a number of different jigs, moulds and templates were constructed as a result of the research I had conducted into the various production techniques chosen. In the majority of cases, I hand-made each of the required moulds, templates and jigs as I was interested in this type of production of multiple forms, and I also wanted to ensure that each piece of furniture in this range had been produced by myself, from the moulds to the final prototypes. While time consuming and somewhat difficult, the process enabled me to build upon my knowledge of several different production techniques. In this way, the time invested in the unseen preparatory stage of the design process was probably the most rewarding and satisfying.

3.2.5 Actual Production and Finishing

Actual production followed and a variety of different fabrication techniques were utilised including rotational moulding, heat-forming acrylic, slip-casting ceramics, stainless steel tube forming, Computer Numerical Controlled (CNC) metal lathe turning, wood lathe turning, fibreglass moulding and aluminium casting. Each of these processes, along with the finishing stage of the design process, is discussed in detail for each individual piece in the following section.

3.3 6S SEAT AND LOW/HIGH TABLES (2000)

3.3.1 Development of the Design

The *6S Seat and Tables* (2000) was inspired by the *SOS Boxes* (1999) that I designed and created as part of the Honours component of my Bachelors degree (refer to Figure 3.0). The *SOS* base-shape is a square with a repeated arc on each side to display a concave/convex effect.

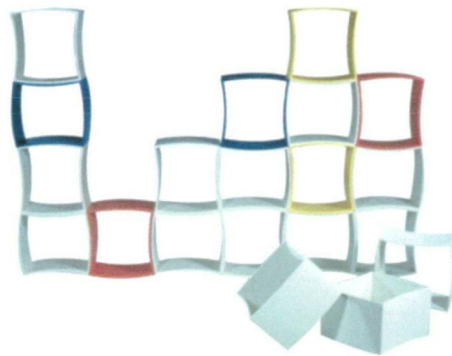


Figure 3.0 *SOS Boxes* (1999) - Laminated MDF and lacquer.

A hexagon created from a circle is used as the base geometric shape in the *6S Seats and Tables* (2000) with identical elliptical shapes removed from each side. Like the *SOS Boxes* (1999), the final shape was able to be connected to itself and this fulfilled the parameter of multiple configuration that I have set for the body of work.

The initial construction of the shape only involved the use of a compass and one radius. The circle provided the base-shape and one radius at six regular intervals was included to provide the hexagon shape (refer to Stage 1 and 2 of Figure 3.1). Three repeated arcs which alternated from concave to convex were also added to the shape (refer to Stage 3 and 4 of Figure 3.1) and the excess parts of the circle where the arcs concaved were then removed to produce the *6S Shape* (refer to Stage 5 of Figure 3.1). At this stage of the design process, the creation of the perfect

shape was necessary in order to ensure it was technically viable (interlocking and connecting features) as well as visually balanced. Only one radius repeated six times around a circle was used to create the shape and consequently, the name 6S, or six-sided form, emerged.

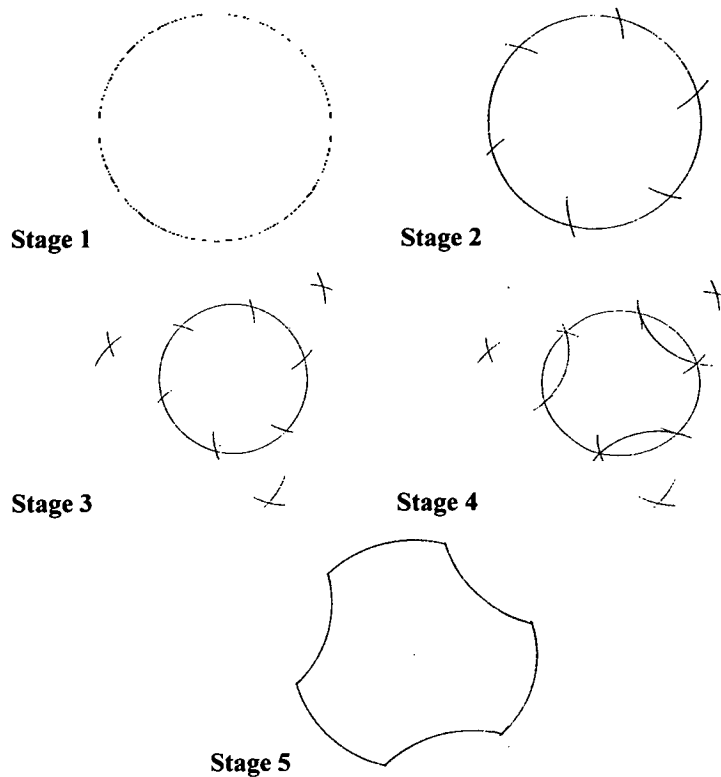


Figure 3.1 Stages 1-5 in the process for designing the 6S Shape.

Given the final shape, transformation into a three-dimensional seat used a spherical basis as this form is easily achieved in production and the connection of hexagonal shapes can create a strong spherical form (similar to the way hexagonal shaped leather is used to create a spherical soccer ball). The three-dimensional spherical shape also allowed interesting voids to be created after the concave curves had been removed. The resulting form was a hollow, three-dimensional version of the 6S Shape. The creation of negative space allows the seat to appear lighter and fragile and the curved under-belly of the form gives it a floating sensation. The hollow nature of the form means it can also double as a storage unit for magazines and books. The 6S

Seat (2000) is clearly a minimal piece with simple, clean lines. It was constructed using only one material and its shape ensures the connection and interlocking parameter can be achieved.

The *6S Low/High Tables* (2000) were designed to accompany the *6S Seats* (2000) and were constructed using the same methods detailed above. The infringement on personal space was an important consideration in the development of the low tables and as such, their purpose is to create a sense of separation between the seats. In public places like foyers or waiting-rooms, people often prefer their own space and therefore choose to leave at least one seat in between themselves and others. The low table is able to provide this personal space without removing any further physical space and it also doubles as a flat, useable surface for books, pot plants, drinks, etc. The higher tables, which consist of the same shape suspended on a pedestal base, were designed more for a bar or café environment to offer a steady, flat surface for food and drinks. These tables were constructed at three different heights to accommodate different situations. For example, one is at 'coffee-table' height, one at 'dining-table' height and finally, the third is at a height that requires the use of stool.

The seats, and tables alike, can be positioned together in a myriad of patterns or they can each be used quite separately from the other with existing furniture in the environment that they are placed. They were all created from the same shape and moulds; the low table is constructed from the lower half of the seat mould and the high table uses the upper half. In this way, I have developed an entire range of furniture from just two moulds. This not only ensured time efficiency, but also cost effectiveness.

3.3.2 Development of the Prototype

a. Computer-Modelling and Scale Models

Once the design was finalised on the computer using the *ZOOM* program, as discussed previously, scale models of the seats were constructed by forming fiberglass over an MDF plug that I had turned on a wood lathe.

b. Production Research and Mock-Ups

Full-sized mock-ups of the seats were then developed by blowing the domes in acrylic. This process was completed at the School of Art and it enabled me to develop my techniques in this area for the later production using plastic and also for the construction of other pieces in the body of work. The acrylic provided the opportunity to explore different methods of removing the elliptical shapes to create the void and further enabled me to ensure the form was technically sound.

Once the form had been finalised, I researched the most appropriate method of producing it in multiples. I discovered that while fibre-glassing would allow me to achieve a clean form, it was not time effective as the glass would have to be tinted and sprayed after completion if a colour was to be added.

Furthermore, while blown acrylic eliminated the colour problem that fibre-glassing created, there were too many variables that could effect the achievement of a consistent and regular shape. I discovered that injection moulded plastic would allow me to achieve the desired shape, consistency and colour, but given the lack of resources in Tasmania, it was not a time or cost effectively feasible. Finally, I discovered rotational moulding. This process is used in Tasmania for producing durable water tanks and is an economical and reliable way of producing consistent plastic forms in any colour. In order to achieve the requisite consistency, however, it was necessary to create

rotational moulding dies (roto-dies), or moulds, from which to make the seats.

c. Pre-Production Preparation

Developing the roto-die was an involved process which required much consultation with the company where the seats were to be produced. The roto-die had to be designed to fit a specific oven and it was decided that the construction of two separate moulds, one each for the top and bottom portions of the seats, was the most effective way to complete the project. This further ensured, that the low and high tables could be cast from the same moulds. It was necessary to make bowl-like roto-dies so removal of the elliptical curves could occur using a band saw once the plastic had been moulded. The creation of dies that did not require further cutting once the plastic was moulded was possible, however, it was not feasible with the pattern making skills I possessed at the time, nor was it economically viable to have it made professionally.

In constructing the die, a pattern was turned on a wood lathe from stack laminated MDF. This process involved the construction of a rough shape from a series of arcs by gluing and clamping them together (refer to Figures 3.2 and 3.3).



Figure 3.2 Roto-Die Production – Turned stack-laminated MDF pieces.



Figure 3.3 Roto-Die Production – Initial construction of the pattern.

Two bowl-shaped objects were then turned; one each for the top and bottom halves of the seats (refer to Figure 3.4). These became the patterns for the roto-dies. The inside of the bowl-shaped had to be the same shape as what I envisaged the exterior of the seat would be. Once completed, the patterns were coated with resin, sanded, sprayed with an auto acrylic undercoat and again sanded until the texture was smooth.

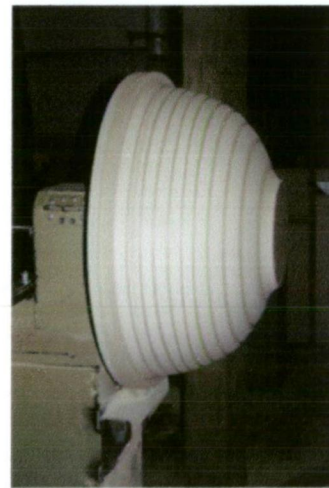


Figure 3.4 Roto-Die Production – Turned bowl-shaped patterns.

The patterns were then sent to Melbourne to be cast in aluminium as there were no companies in Tasmania that had any real experience in this type of work. Once cast, I then machined the moulds and made lids for the domes (refer to Figures 3.5 and

3.6). It was necessary for the roto-dies to possess an air inlet/outlet to assist in the cooling process and further, to allow air to pass through the mould so as not to create a vacuum. These breather-holes were placed in the lids. The lids also had to be fitted with clamps to ensure they could be removed with ease (refer to Figure 3.7).



Figure 3.5 *Roto-Die Production* – Aluminium-machined moulds.



Figure 3.6 *Roto-Die Production* – Aluminium-machined moulds with lids.



Figure 3.7 *Roto-Die Production* – Moulds with one lid removed.

Next, an appropriate surface for the inside of the roto-die had to be considered. I experimented with a variety of different surfaces including sand-blasting and grit-blasting. Given the nature of cast aluminium, pin-holes or air bubbles emerged when the dome was sand-blasted resulting in an irregular surface. In order to cover the pin-holes, I grit-blasted the dome as this provides a heavier blasting process than sand-blasting does. After experimenting with the plastic, however, the grit-blasted texture proved too rough as it caused the moulded plastic to collect dirt and ensured it was difficult to clean. After conducting some further research and obtaining specialist advice regarding the finishing of moulds, I coated the dies with a high heat enamel. Due to incorrect specialist advice, however, the enamel left a stipple-like texture and was only rectified when the moulds were painted and sanded several times. The dies were then painted with a mould releasing agent so the plastic would not stick. Eventually, I was able to achieve the type of smooth texture I desired using this technique and this procedure completed the pre-production stage of the design process.

d. Actual Production and Finishing

The roto-dies were then ready for use and calculations regarding wall thickness were completed in order to determine the correct amount of plastic powder required for each form. Colour selection was then made, and subsequent moulding commenced. In a very time effective manner, I was able to mould a large number of forms without difficulty.

Once moulding was completed, the three elliptical sections were cut from both halves on the band saw using a jig that I had created (refer to Figure 3.8). This ensured each cut was identical and further ensured the range of seats and tables would remain consistent and co-ordinated.

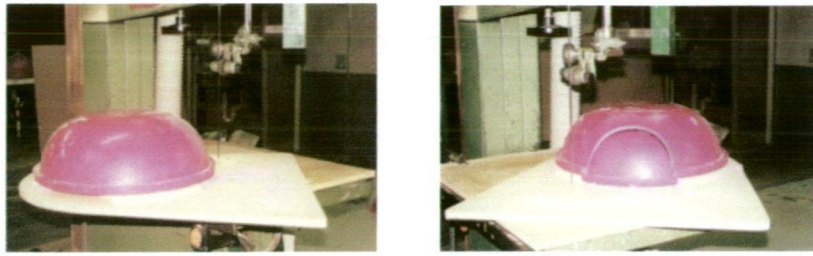


Figure 3.8 *SOS Seat Production* – Jig used to remove elliptical sections.

Finally, the edges were cleaned up and the two halves were plastic welded together to create the spherically-shaped seat. In all, seventeen seats were created using the process outlined above (refer to Figure 3.9).



Figure 3.9 *SOS Seats and One Low Table (2001)* – Moulded Polyethylene.

In the case of the low tables, three small legs were machined using a computer-operated lathe. This machine allows a drawing of the legs to be scanned into a computer. It is then programmed to commence and proceeds to create the requisite number of legs, in this case, thirty-six. The table tops were then completed using MDF. They were cut using a template and overhead router, (refer to Figure 3.10) sprayed the same colours as the plastics and finally, attached to the half domes. A total of five low tables were produced (refer to Figure 3.9).



Figure 3.10 *SOS Table Top Production* – Over-head router used to cut tops.

The high tables used the same table tops as the low tables, but required the further construction of a fiberglass mould for their bases. This involved undertaking a similar process as that used to develop the seat moulds, except the finished mould was created from fiberglass. Also, the three different sized aluminium poles for the legs were made. These components were simply screwed and attached. A total of six high tables were produced.

3.3.3. Final Remarks

The process involved in the development of the *6S Seats and Tables* (2000) has proven successful from all perspectives. The design was able to be produced in a timely and cost effective manner and in accordance with the set parameters of the research project. Minor features would require amendment before these pieces could be mass-produced, including the development of a mould with the elliptical curves already removed before moulding commenced, and the development of a colour range. Nevertheless, the pieces designed for this body of work are appropriate. Essentially, they are minimal, yet attractive in shape, produced in multiple forms and most importantly, are modular, with seemingly endless interlocking and connection possibilities.

3.4 CLUSTER LIGHT (2000)

3.4.1 Development of the Design

The impetus for the *Cluster Light* (2000) was derived from the elliptical-shaped off-cuts that were removed from the *6S Seats and Tables* (2000). Three of these off-cuts, when positioned appropriately, form a circle and the base of the light evolved from this positioning (refer to Figure 3.11).



Figure 3.11 *Cluster Light Production* – Elliptical off-cuts from *SOS Seats*.

The stem of the light evolved from a cabinet I had designed in 1997. The exterior shape of the cabinet was designed to represent the stereotypical hourglass female form but was slightly bulky when used in the cabinet. Taking this into consideration, I attempted to develop the same form with a little more elegance. The use of movement often gives furniture a lighter appearance and I was able to achieve this feeling by creating the three stems at differing heights.

The lampshade was also derived from the elliptical off-cuts from the *6S Seats and Tables* (2000). Unlike the base, however, I inverted the shape to create a more appealing form and adapted it slightly to ensure ease of production.

The *Cluster Light* (2000) is also a minimal piece with simple, clean lines. Given its shape and the fact that it has three separate components, the connection and interlocking parameter can be

achieved and the light can be positioned in a number of different configurations.

3.4.2 Development of the Prototype

a-c. Computer-Modelling, Production Research and Pre-Production Preparation

Like all my designs, the light was sketched, adapted and finalised using computer-modelling techniques. Scale models were also constructed and various production techniques were researched. In the pre-production phase of the process, it was necessary to create jigs to ensure consistency throughout production of the stems and the three individual pieces that collectively constitute the base.

d. Actual Production and Finishing

The shape of the stem was sketched full size and adapted until the curves represented the form I desired. A mould was then created for the purpose of ensuring that each of the stems were identical. With the use of a bending jig I also created, the mould was then adjusted to ensure the curves were bent to resemble the same shape as the full size drawing. This mould was used to bend the stainless steel to form the stems. Subsequent to this procedure, the stems were positioned on the base and the tops were adjusted so as to achieve a staggered height.

The base was made from stack-laminated timber and was constructed by attaching the three elliptical shapes to a backing board and turning them on a wood lathe (refer to Figure 3.12). This ensured each of the three forms could be shaped identically.

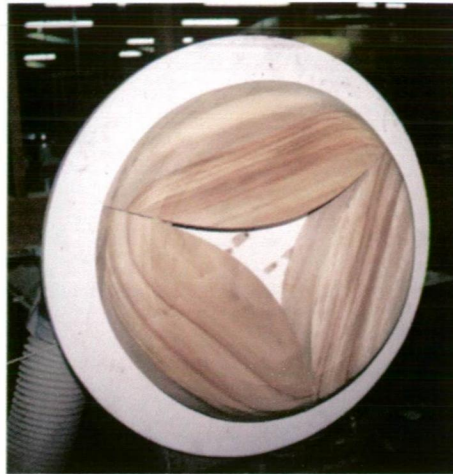


Figure 3.12 *Cluster Light Production* – Turned stack-laminated base.

The initial light shades were constructed from fiberglass (refer Figure 3.13). A timber mould was created and a fiberglass mould was subsequently constructed from the timber one. The fiberglass shades were then made and painted. Coloured polypropylene was used for the front of the shade. In the first instance, orange was chosen for its vibrancy. Small halogen globes were used for illumination and these cast bright light toward the ceiling in much the same way as an up-light.

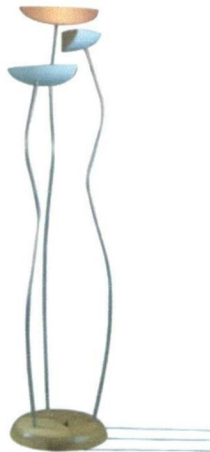


Figure 3.13 *Original Cluster Light (2000)* – Moulded fiberglass, timber, polypropylene and stainless steel.

Using fiberglass is not particularly time effective and as such, I researched a variety of other materials and production methods in order to achieve a more cohesive production process for the light shades. I discovered that blown acrylic appeared to provide an

appropriate alternative. I experimented at blowing the acrylic and using heat lamps and hot air-guns, however, hanging the acrylic inside a ceramics oven proved to be the most successful method. Once heated, the acrylic must be clamped to a desk that has an air inlet attached to it in order for it to be blown. I clamped it using a jig I created that had the exterior shape of the light shade cut into it. The void in the template allowed the plastic to rise like a bubble. Given the design of the shades, I had to blow two different sized bubbles and I achieved this by changing the air pressure.

I further decided to change the type of globes used in the design to cooler, more energy efficient ones. Consequently, I was able to fully enclose the globe which allows it to glow and cast a more even light throughout the environment in which it is placed. Furthermore, the acrylic reacts better to light than the fiberglass as it has a semi-opaque finish and causes a gentle glow.

3.4.3 Final Thoughts

The *Cluster Light* (2000) is a group of simple, yet elegant forms which function as a mood light or focal point in any given environment. In accordance with the set parameters of the research project, it is modular in that it can be configured differently to suit a variety of situations. Each of the three pieces can be clustered to create the hourglass female form, or separated to exist individually. The adaptations made throughout the design process have not only ensured the light could be mass-produced far more effectively in the future, but enabled the creation of a more aesthetically pleasing final prototype.

3.5 *MLS LIGHTS* (2001)

3.5.1 Development of the Design

After realising that the roto-dies I had constructed for the *6S Seats and Tables* (2000) would have to be modified before mass-production could occur, I decided to take full advantage of the rotational moulding production technique by attempting to create another piece. My intention was to achieve a form that could be mass-produced immediately, if necessary. Hence the development of the *MLS Lights* (2001).

The shape of the light is loosely based on the spherical form used in *6S Seats and Tables* (2000), however, only one elliptical section has been removed. Modularity in the design was a primary concern and as such, I designed the light with four separate and distinct functions. It can be hung in four different positions, used as two separate wall lights, stacked with two or more pieces or used as a floor light.

The lights are clearly simple, yet particularly versatile. They can be used effectively individually or in conjunction with each other in a range of different environments. Furthermore, the design is not only time efficient, but particularly cost effective as each variation of the form uses the same shape and mould in its construction.

3.5.2 Development of the Prototype

a-b. Computer-Modelling and Production Research

Computer-modelling, scale modelling and the research of production techniques were undertaken in order to complete the design.

c. Pre-Production Preparation

Similar to the pre-production phase in the development of the *6S Seats and Tables* (2000), the development of a roto-die was again necessary to ensure consistency. The same production processes as those described above were used in this instance, however, the dies differ in that *MLS* die is made from two equal halves. As such, it was only necessary to make one initial timber pattern and this pattern was then cast twice in aluminium to create the requisite roto-die (refer to Figure 3.14). Furthermore, the textures on the inside of the dies also differ. While the *6S* die is smooth, the *MLS* die was lightly sand-blasted to produce a matte-type finish on the moulded product.

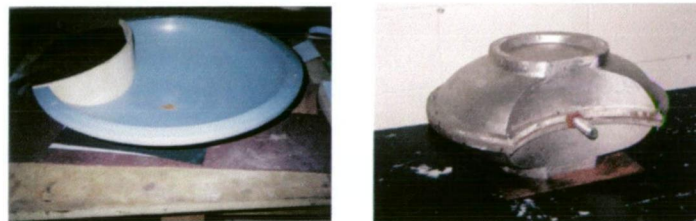


Figure 3.14 Roto-Die Production – Initial construction of the pattern and aluminium-machined mould.

d. Actual Production and Finishing

Once the die was complete, I was able to finalise calculations for wall thickness and then commence moulding. In a very time efficient manner, I was able to mould a total of twenty forms without difficulty.

The final stage involved the construction of a polypropylene sheet designed to fit over the face of the elliptical section to reduce the brightness of the light emitted from the globe. After testing different globes, I decided to use tri-phosphor globes as they cast a very white light. This assisted in achieving purity in the design.

Once complete, the lights can then be wired accordingly, depending on the type of formation desired.

3.5.3. Final Remarks

The *MLS Lights* (2001) have achieved their purpose of using the rotational moulding production technique to its full capacity. The light is extremely versatile and modular and the variety of possible formations exist including hanging lights, wall lights, stack lights and floor lights. The developmental process was clearly successful, particularly in terms of cost effectiveness, and the result is not only functional, but contemporary and stylish.

3.6 CLUSTER VASES (2001)

3.6.1 Development of the Design

The *Cluster Vases* (2001) were developed to accompany the *Cluster Light* (2000). When clustered together, the three lights I developed resemble long-stemmed flowers, hence the desire to design a range of vases that would coincide with the shape and style of the other furniture in the body of work. Like the bases and shades of the *Cluster Light* (2000), the shape for the vases evolved from the elliptical off-cuts from the *6S Seats and Tables* (2000) and a set is comprised of three vases of varying heights.

The vases are a simple design which offer a more tactile interaction than what can be achieved with the *Cluster Light* (2000). Like the *6S Seats and Tables* (2000), the vases are easily adapted and moved to create a myriad of different patterns and configurations, thus fulfilling the parameters of the research project.

3.6.2 Development of the Prototype

a-c. Computer-Modelling, Production Research and Pre-Production Preparation

Computer-modelling, scale modelling and the research of production techniques were undertaken. In the pre-production phase of the process, it was again necessary to create jigs to ensure consistency in the production of the curves of the vases.

d. Actual Production and Finishing

Initially, models from which plaster moulds could subsequently be created were developed. The models were made from stack laminated timber and turned on a wood lathe (refer to Figure 3.15). Despite the vases being three different heights, the models were turned together on the lathe to ensure the curves where identical on each of the pieces. The models were then sanded and sprayed before the plaster moulding could occur.



Figure 3.15 *Vase Model Production* – Turned stack-laminated mould.

The plaster was poured with a conical-shaped piece placed in the middle to create the vessel part of the vase (refer to Figures 3.16 and 3.17).

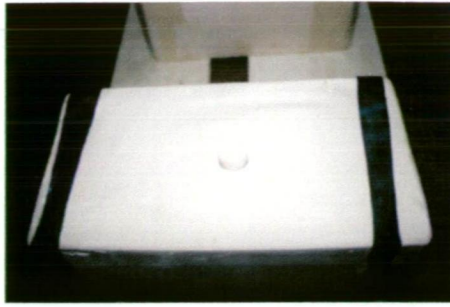


Figure 3.16 *Cluster Vase Production* – Conical-shaped piece to create vessel part of vase.

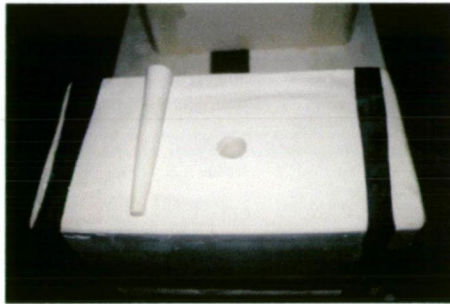


Figure 3.17 *Cluster Vase Production* – Conical-shaped piece removed.

The production technique of slip casting was used to make the vases. The earthen ware slip was left for fifteen minutes before being removed from the plaster mould. This wait period ensured the correct wall thickness could be achieved, and further ensured multiple forms could be created with ease. Subsequent to this procedure, the bases of the vases were leveled, sanded and finally, glazed (refer to Figure 3.18). A total of twenty-four vases were produced using the method outlined above.

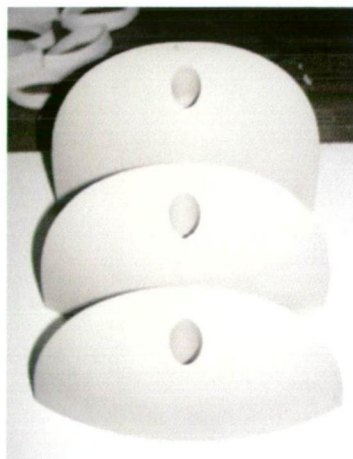


Figure 3.18 *Cluster Vases (2001)* – Slip casted earthen wear slip.

3.6.3 Final Remarks

The *Cluster Vases* (2001) are minimal in design like the remainder of the range of furniture. They have a more directly tactile quality and are more versatile than the other pieces owing to their size and weight. Furthermore, the fact that each set has three different sized vases ensures multiple configuration is not only possible, but expected. Their ability to double as candle or pen holders also illustrates their extreme versatility. This design is clearly successful and the seemingly unlimited possible configurations of the pieces ensure it falls within the parameters set for this research project.

3.7 DESIGN DIFFICULTIES AND SOLUTIONS

Throughout the research project, numerous difficulties involving the design of proto-type objects for production and the production of the actual pieces of furniture were experienced. Three major difficulties presented themselves during the actual production and finishing phase, including: deciding upon a base shape and the derivatives of that shape; the development of moulds and the actual rotational moulding process; and finally, the process associated with slip casting. Other smaller problems also arose, however, each of these difficulties was overcome fairly easily using experimentation and problem-solving techniques.

3.7.1 Bases Shapes and Derivatives of Shapes

One of the major difficulties experienced was deciding on a shape. I had set myself a parameter to only use shapes that could interlock. Furthermore, I had to be able to create forms that could be created in multiples and yet, individual pieces also had to co-ordinate with each other as an entire range. I was able to resolve this problem by choosing and utilising the same base

shape, the circle, in each piece of furniture I designed. This decision ensured I had to experiment with all the possible derivatives the circle could offer. The result of this process was the discovery of the concave/convex hexagonal shape, the elliptical shape and also, the shape used in the *MLS Lights* (2001). These shapes were all able to interlock and as they had all originated from the same initial shape, the individual pieces of furniture related well to each other.

3.7.2 Rotational Moulding

Often, the form I had designed had to be adapted in order for it to undergo multiple production. The rotationally moulded work had to be completely resolved before the moulds were made. As such, I had to ensure all the forms contained simple lines and that any joins were eliminated before production commenced so they could be removed from the roto-die without incident.

Furthermore, the roto-dies also had to be resolved before moulding commenced. Breather-holes had to be incorporated to ensure the plastic cooled to the requisite level before it was removed. However, the breather-holes were a problem in themselves as they had to be placed strategically so as not to interrupt the shape of the final product.

In the case of the *MLS Lights* (2001), it was necessary to cut the form into two equal halves so it could be transformed into a wall light. Considering the number of the lights I decided to make, it would not have been time effective to measure up each individual form before it was cut. Also, the degree of accuracy may have been questionable. As such, I designed the roto-die for the lights so that it left a visible join-line. The width of the join-line enabled the lights to be cut into equal halves without having to draw lines on each. This process was used for not only the wall mounted lights, but also the hanging and stack lights.

The difficulty experienced in developing the mould for the *6S Seats and Tables* (2000) was that I also wanted to create two different sized tables that could be used in conjunction with the seats. Rather than create a separate mould for each, I was able to maximise the output potential of the mould for the seats by ensuring each seat was made in two separate pieces. This then allowed the tables to be moulded in the same roto-die. Once moulded, the tables were practically complete apart from a simple top that was added. Despite the necessity to join the two halves, the seats were also practically complete once moulded.

Rotational moulding did present some challenges. The production of the patterns for the roto dies proved timely as I constructed them myself, relying on my own pattern-making, fitter and turner, and mould assembling skills. Nevertheless, as I intended on creating a range of furniture that was similar in size and shape, the benefit was that once the three moulds had been constructed and a solution had been discovered for any problems that surfaced, it was possible to simply set the mould and complete the requisite number of forms in a timely and accurate manner.

3.7.3 Slip Casting

The decision to slip cast the *Cluster Vases* (2001) was important as like rotational moulding, this technique allows for easy multiple production. While the process was successful, my lack of knowledge of clay and how it reacts to certain glazes ensured a trial and error process was unavoidable. As such, some of the vases were destroyed. However, like the roto-dies, once perfected, the process was highly time effective and successful.

3.7.4 Other Difficulties

A number of other, smaller difficulties surfaced throughout production of the furniture. For example, access to the requisite machinery was a concern, as were the economic costs involved. The decision to use plastics in my range of furniture did provide a solution. Also, once moulding was completed, all further cutting, planning and final processing of the polyethylene could be completed on the woodwork machinery available at the School of Art. Furthermore, the use of polyethylene was more cost effective than wood and lacquers, for example.

Also, despite its ability to withstand high heat, the use of aluminium in both the initial construction of the roto-dies and in the legs for the low tables proved problematic in that I had to learn how to turn the aluminium on the CNC metal lathe. This skill, however, has proven valuable as I will be able to draw on it in the development of future designs if required.

3.8 FINAL REMARKS REGARDING THE DESIGN AND PRODUCTION PROCESS

Essentially, all the production techniques and fabrications methods utilised in the development of this range of furniture were beneficial and successful. Furthermore, the technical knowledge and skills I acquired whilst completing various pieces will enable me to continue my research into production techniques and to pursue more contemporary fabrication methods in the future.

While challenging, the techniques pursued enabled me to successfully meet the parameters I set and create a range of furniture that was minimal in shape, yet stylish and aesthetically pleasing. Furthermore, I was able to create multiple forms that express modularity both individually, and as a group. In this

way, the furniture is flexible, versatile and easily adaptable. Additionally, each of the pieces can be produced in an efficient and economically viable manner if desired.

4.0 CONCLUSION

4.1 SIGNIFICANCE AND RELEVANCE OF THE RESEARCH PROJECT

Rather than relying on traditional geometric forms, smooth-flowing humanised forms have been utilised in the creation of this body of work in accordance with current trends in contemporary design. The furniture has been humanised or given the human characteristics of soft rounded (not imposing) forms so people can relate and feel safe to approach and use the furniture. Smooth rounded forms also offer comfort in the way that the hand and body can easily adapt to it. In this way, the furniture created has pushed the boundaries of connection and modularity. I have based the entire collection on these concepts and this has enabled me to create multiples of each form, as opposed to just one or two pieces.

Furthermore, the fabrication methods and technology used in the construction of the body of work has contributed to the field of contemporary furniture design as not only are they interesting, time efficient and cost effective, but fairly novel in terms of their widespread use in the design and production of contemporary furniture.

While the body of work I created for this research project falls neatly into the confines of what is termed the 'contemporary furniture design field', it also challenges those confines by extending industrial manufacturing techniques to the design and production of furniture for a contemporary society. Particularly in Tasmania where most designers are using more traditional forms of production to create contemporary looking designs. The body of work has also proved that Tasmania has the ability to produce furniture using modern manufacturing techniques.

4.2 FINAL REMARKS

The pieces of furniture designed and developed for this research project are adaptable, dynamic and a reflection of contemporary Australian culture. Their modularity enables people to interact freely with them to create different arrangements and configurations, thus promoting individualism and creative expression. Furthermore, their suitability for placement in a variety of different environments, both public and private, and their style of placement including floor, wall, ceiling and on plinths, enhances the overall flexibility of the range and ensures all facets of space have been utilised to their full potential. Given these factors, it is clearly evident that the initial aim of the research project has been satisfied within the parameters set at commencement.

The research and exploration of various novel production techniques and technology ensured multiple numbers of each form could be fabricated, while further ensuring consistency throughout. Furthermore, this research also enabled the production of each form in the most time effective and cost efficient manner possible.

Essentially, a co-ordinated, unified and coherent range of furniture has resulted from my research. All the individual pieces designed and developed for the range co-ordinate with each other to create a harmonious balance. Nevertheless, each piece is also clearly individual and diverse in its own right. While they can be placed together with the other pieces, they can also be placed individually and adapted without difficulty to meet the needs of all consumers and environments. In this way, the body of work challenges the conventional, and somewhat restrictive, 'single-

purpose' boundary, which is often placed on the use of furniture in both public and private environments.

The completion of this research project has had a significant impact on my own development as a designer as I have gained a wealth of knowledge about novel production technology and fabrication techniques. Undoubtedly, these techniques will prove important and influential in my creative future and will assist in ensuring the continual improvement of product in future generations, both in terms of technological viability and aesthetic qualities.

5.0 REFERENCE LIST AND BIBLIOGRAPHY

5.1 REFERENCE LIST

5.1.1 Reference Texts

Rawsthorn, A (1999) *Marc Newson*.

Great Britain: Booth-Clibborn Editions. 1999.

Sparke, P (2001) *Design Directory Great Britain*.

Great Britain: Pavilion Books Ltd. 2001.

Stecyk, C (1999) *Dysfunctional*.

Great Britain: Booth-Clibborn Editions. 1999.

5.1.2 Magazines and Other Publications

Doherty, S (Ed.) (1997) *Tracks Surfing Magazine*.

Australia: EMAP Australia Pty. Ltd. 1997.

All copies in the date range: January 1997–December 2001.

Elliss, R (Ed.) (1994) *SW Surfing Magazine*.

Australia: Breaker Publications Pty. Ltd. 1994.

All copies in the date range: 1994–2000.

Khiu, J (Ed.) (1999) *Monument Magazine*.

Australia: Terraplane Press. 1999.

All copies in the date range: August/September 1999–August/September 2001.

Khiu, J (Ed.) (2000) *Monument Magazine – Design Special 2000*.

Australia: Terraplane Press. 2000.

Ridgway, N (Ed.) (1998) *Waves Surfing Magazine*.

Australia: EMAP Australia Pty. Ltd. 1998.

All copies in the date range: January 1998–December 2001.

5.2 BIBLIOGRAPHY

5.2.1 Reference Texts

Bayley, S (1996) *Twentieth-Century Style and Design*.

Great Britain: Thames and Hudson Inc. 1996.

Byars, M (1997) *50 Chairs Innovations in Design and Materials*.

Switzerland: Roto Vision SA. 1997.

Byars, M (1997) *50 Lights Innovations in Design and Materials*.

Switzerland: Roto Vision SA. 1997.

Byars, M (1998) *50 Products Innovations in Design and Materials*.

Switzerland: Roto Vision SA. 1998.

Byars, M (1998) *50 Tables Innovations in Design and Materials*.

Switzerland: Rot Vision SA. 1997.

Carrington, N (1976) *Industrial Design in Britain*.

London: George Allen and Unwin Ltd. 1976.

Collins, M (1989) *Post-Modern Design*.

Great Britain: Academy Editions. 1989.

De Noblet, J (1993) *Industrial Design: Reflection of a Century*.

France: Fammarion/APCI. 1993.

Dietz, M (1994) *Japanese Design*.

Germany: Benedikt Taschen Verlag GmbH. 1994.

Dietz, M (1993) *300 Lights*.

Germany: Benedikt Taschen Verlag GmbH. 1993.

Dormer, P (1990) *Design Since 1945*.

Great Britain: Thames and Hudson. 1990.

Dormer, P (1990) *The Meaning of Modern Design: Towards the 21st Century*.

Great Britain: Thames and Hudson. 1990.

Fiell, P & C (1999) *Design of the 20th Century*.

Germany: Benedikt Taschen Verlag GmbH. 1999.

Fiell, P & C (2001) *Designing the 21st Century*.

Germany: Benedikt Taschen Verlag GmbH. 2001.

Fiell, P & C (1997) *1000 Chairs*.

Germany: Benedikt Taschen Verlag GmbH. 1997.

Goslett, D (1971) *The Professional Practice of Design*.

Great Britain: Bt. Batsford Ltd. 1971.

Greenhalgh. P (1990) *Modernity in Design*.
Great Britain: Reaktion Books Ltd. 1990.

Harlang. C, Helmer-Petersen. K and Kjaerholm. K (1999) *Poul Kjaerholm*.
Germany: Arkitema Forlag. 1999.

Haufler. T (1998) *Design A Concise History*.
Great Britain: Laurence King Publishing. 1998.

Rawsthorn. A (1999) *Marc Newson*.
London: Booth-Clibborn Editions. 1999.

Slesin. S (1987) *Japanese Style*.
Great Britain: Thames Hudson Ltd., London. 1987.

Sparke. P (2001) *Design Directory Great Britain*.
London: Pavilion Books Ltd. 2001.

Stecyk. C (1999) *Dysfunctional*.
Great Britain: Booth-Clibborn Editions. 1999.

Sudjic. D (1999) *Ron Arid*.
Great Britain: Laurence King Publishing. 1999.

Thakara. J (1988) *Design After Modernism: Beyond the Object*.
Great Britain: Thames and Hudson LTD. 1988.

Wolff. L and Xu. W (2001) *Ali Taylar - Parallel Design*.
China: China Youth Press. 2001.

Wolff. L and Xu. W (2001) *G7*.
China: China Youth Press. 2001.

Wolff. L and Xu. W (2001) *Harry Allen*.
China: China Youth Press. 2001.

5.2.2 Magazines and Other Publications

Doherty. S (Ed.) (1997) *Tracks Surfing Magazine*.
Australia: EMAP Australia Pty. Ltd. 1997.
All copies in the date range: January 1997–December 2001.

Elliss. R (Ed.) (1994) *SW Surfing Magazine*.
Australia: Breaker Publications Pty. Ltd. 1994.
All copies in the date range: 1994–2000.

Harris. S (Ed.) (2000) *Houses*.
Australia: Architecture Media. 2000.
All copies in the date range: 1998-2000.

Khiu. J (Ed.) (1999) *Monument Magazine*.
Australia: Terraplane Press. 1999.
All copies in the date range: August/September 1999-August/September 2001.

Khiu. J (Ed.) (2000) *Monument Magazine – Design Special 2000*.
Australia: Terraplane Press. 2000.

McEion. E (Ed.) (1999) *Inside Magazine (Interior Review Editions)*.
Australia: Niche Publishing. 1999.
All copies in the date range: January 1999–December 2001.

Michell. C. (Ed.) (2000) *One Design Matters*.
United States of America: One media, Inc. 2000.
All copies in the date range: 2000-2001.

O'Brien. S (Ed.) (2000) *Indesign*.
Australia: Indesign Media Pty. Ltd. 2000.
All copies in the date range: 2000–2001.

Ridgway. N (Ed.) (1998) *Waves Surfing Magazine*.
Australia: EMAP Australia Pty. Ltd. 1998.
All copies in the date range: January 1998–December 2001.

Rodger. N (Ed.) (2001) *Azure*.
Canada: Azure Publishing Inc. 2001.
All copies in the date range: January 2001–May 2001.

6.0 APPENDICES

6.1 APPENDIX ONE: CURRICULUM VITAE

Attached is a copy of my Curriculum Vitae, current as at February, 2002.

CIRRICULUM VITAE

Craig Rex Harris

PERSONAL DETAILS

NAME: Craig Rex Harris

DATE OF BIRTH: 08 September 1976

CONTACT DETAILS:

Semester Address: PO Box 790
Sandy Bay, Tasmania
Australia. 7006

Telephone:
Residential (03) 6223 2503
Mobile 040 8634 268

Permanent Address: PO Box 321
The Junction, New South Wales
Australia. 2291

Telephone:
Residential (02) 4963 4268
Mobile 040 8634 268

Email: craigharris101@yahoo.com

EDUCATION

EDUCATION:

- Present (2000-2002)** *Masters of Fine Arts - University Of Tasmania.*
Major: Furniture Design.
Note: Currently undertaking this course.
Expected completion date: Feb 2002.
- 1999** *Bachelor of Fine Arts (Honours) - Uni Of Tasmania.*
Major: Furniture Design.
Grade: First Class Honours (Upper Division).
- 1996 – 1998** *Bachelor of Fine Arts – University Of Tasmania.*
Major: Furniture Design.
Grade: High Distinction (average).
- 1995** *Diploma Of Graphic Design -*
Chase School Of Graphic Design, Sydney.
- 1994** *Higher School Certificate of New South Wales (HSC) -*
St Joseph's College, Sydney, NSW.

ACADEMIC AWARDS & ACHIEVEMENTS:

- 2000** *Australian Post-Graduate Award Scholarship.*
University of Tasmania.
To study Masters of Fine Arts (Furniture Design).
- 1990** *Bachelor of Fine Arts (Honours).*
University of Tasmania.
Achieved First Class Honours (upper division).
- 1998** *Golden Key Society (Academic Achievement Society).*
University of Tasmania.
Consistently achieved grades in the top 15 % of Uni.

EXHIBITIONS

GROUP EXHIBITIONS:

- 2001** *Wood Design Collection (2001)*
City Hall - Hobart, Tasmania.
- 2000** *Design = Function + Fibre (2000)*
Long Gallery - Hobart, Tasmania.
- Biennale Internationale Design*
Biennale Gallery - St Etienne, France.
- Go: Designed for Production*
Carnegie Gallery - Hobart, Tasmania.
- The French Connection*
The Fine Arts Gallery - Hobart, Tasmania.
- 1999** *Showing Off (Honours Exhibition)*
Plimsoll Gallery - Hobart, Tasmania.
- Wood Design Collection (1999)*
City Hall - Hobart, Tasmania.
- Design = Function (1999)*
Long Gallery - Hobart, Tasmania.
- Video Case Travelling Exhibition*
University Of Tasmania - Hobart, Tasmania.
- 1998** *Foyerism (3rd Yr Bachelor of Fine Arts Exhibition)*
Bond Store (Tas Art Gallery) - Hobart, Tasmania.
- In House (1998)*
Entrepot Gallery - Hobart, Tasmania.
- Design = Function (1998)*
Long Gallery - Hobart, Tasmania.
- International Student Exhibition*
Central Gallery - Kuala Lumpur, Malaysia.
- International Student Exhibition*
Johor Baru Gallery - Kuala Lumpur, Malaysia.

1997*In House (1997)*

Entrepot Gallery - Hobart, Tasmania.

Wood Design Collection (1997)

City Hall - Hobart, Tasmania.

COMMISSIONS & PUBLICATIONS

COMMISSIONS:

- 2000** *Private Doctor's Office*
Shelving Unit (SOS Boxes).
Work developed as part of Bachelor of Fine Arts degree
(Honours year).
- 1999** *Nu Bar*
Screen.
Work developed as part of Bachelor of Fine Arts degree
(Third year).
- 1999** *Conservatorium Of Music – University Of Tasmania*
Foyer Fit-Out including counter and screen.
Work developed as part of Bachelor of Fine Arts degree
(Third year).
- 1998 - 1999** *General Population Of Sydney, Hobart & Byron Bay*
Designer Skateboards.
- 1997** *Steven Harris - Wine Sales Representative*
Cocktail Bar & Cabinet.
Work developed as part of Bachelor of Fine Arts degree
(Second year).

PUBLICATIONS:

- 2001** *Object Magazine - Page 67.*
- 2000** *Art & Design Education Resource Guide - Page 80.*
- 2000** *The Mercury Newspaper (Wednesday, November 22) - Page 27*
- 1998** *In House Online*
<http://www.artschool.utas.edu.au/exhibitions98/inhouse/harrisc>

RELEVANT WORK EXPERIENCE**WORK EXPERIENCE:****1999 – Present**

Plimsoll Gallery – University Of Tasmania.

Global Poly Water tanks – Assisting with production of water tanks & developing my own designs

Assisting 1st – Honours years students in both wood and metal work shops

Various work at galleries (manning the gallery)

Woodwork Technician – University Of Tasmania
Working as replacement Technician**1998**Work Placement With Mark Philips (Designer/Maker)
Involved working on designs with Mark and working in his woodwork classes with Hobart and Elizabeth Colleges, Hobart, Tasmania.